

①

$$\begin{aligned} x + y &= 8 \quad \text{we know } y = 2 \\ 2x - y &= 10 \end{aligned}$$

$$\textcircled{1} \quad x + 2 = 8$$

$$x = 6$$

Check in ②

$$\frac{LS}{2x - y} = \frac{RS}{10}$$

$$\frac{2(6) - 2}{12 - 12} = \frac{10}{10}$$

$$LS = RS \quad \therefore x = 6$$

②

$$\begin{aligned} 2x + 5y &= 10 \rightarrow y = -\frac{2}{5}x + 2 \quad m = -\frac{2}{5} \\ 3x + y &= 6 \rightarrow y = -3x + 6 \quad m = -3 \end{aligned}$$

Slopes are not the same  $\therefore$  not parallel and not the same line

$\therefore$  these lines will intersect once.

$$\textcircled{3} \quad 10x + 6y = 24$$

$$\begin{aligned} y &= \text{int} & x &= \text{int} \\ 6y &= 24 & 6x &= 24 \\ y &= 4 & x &= 4 \end{aligned}$$

$$\text{b) } 5x - y - 8 = 0$$

$$\begin{aligned} y &= 5x - 8 \\ m &= 5 \\ b &= -8 \end{aligned}$$

c) (2, 2)

4) you could sub (3, 5) into both equations.  
or you can solve by substitution/elimination/graphing

$$\begin{aligned} 3x + 2y &= 19 \\ + \quad 5x - 2y &= 5 \\ \hline 8x &= 24 \\ x &= 3 \end{aligned}$$

$$\begin{aligned} 3(3) + 2y &= 19 \\ 9 + 2y &= 19 \\ 2y &= 10 \\ y &= 5 \end{aligned}$$

$\therefore$  P.I. is (3, 5)

⑤

$$\begin{aligned} 3x + y - 5 &= 0 \quad ① \\ x - 2y &= 11 \quad ② \end{aligned}$$

$$②: x = 2y + 11$$

② → ①

$$\begin{aligned} 3(2y + 11) + y - 5 &= 0 \\ 6y + 33 + y - 5 &= 0 \\ 7y + 28 &= 0 \\ 7y &= -28 \\ y &= -4 \end{aligned}$$

$$\text{Sub } y = -4 \text{ into } ②$$

$$x = 2(-4) + 11$$

$$x = -8 + 11$$

$$x = 3$$

$$\therefore \text{POI is } (3, -4)$$

⑥

$$\begin{aligned} 3x - 2y &= -8 \quad ① \\ 3y - 21 &= 9x \quad ② \end{aligned}$$

$$3 \times ①: 9x - 2y = -24$$

$$②: -9x + 3y = 21 \quad (\text{rearranged})$$

$$\hline -3y = -3 \quad (\text{added})$$

$$y = 1$$

$$\text{Sub } y = 1 \text{ into } ①$$

$$3x - 2(1) = -8$$

$$3x - 2 = -8$$

$$3x = -6$$

$$x = -2$$

$$\therefore \text{POI is } (-2, 1)$$

- ⑦ Look at coefficients  
Signs same  $\rightarrow$  subtract

- ⑧ POI is still (2, 5).

- ⑨ Let  $c$  be the # of cars  
Let  $b$  be the # of busses

$$c + b = 102 \quad (1)$$

$$3c + 10b = 418 \quad (2)$$

$$(1) \quad c = 102 - b$$

$$(1) \rightarrow (2) \quad 3(102 - b) + 10b = 418$$

$$b = 16 \quad 16 \text{ busses}$$

- (10a) let  $x$  be 1<sup>st</sup> number  
let  $y$  be 2<sup>nd</sup> number

$$\frac{x+y}{4} = 12 \quad (1) \quad 2x + 24 = 2y \quad (2)$$

- b) let  $x$  be kg of \$0.80 soap  
let  $y$  be kg of \$1.50 soap

$$x + y = 20$$

$$0.8x + 1.5y = 20(1.01)$$

$$(11) \quad \begin{aligned} x + y + z &= 3 \quad (1) \\ y &= 4x \quad (2) \\ z &= -2x \quad (3) \end{aligned}$$

Sub (3) & (2) into (1)

$$x + 4x - 2x = 3$$

$$3x = 3$$

$$x = 1$$

$$y = 4(1)$$

$$y = 4$$

$$z = -2(1)$$

$$z = -2$$